

**From:** Rochlin, Kevin  
**Sent:** Friday, September 13, 2013 12:43 PM  
**To:** Barbara Ritchie  
**Cc:** Rochlin, Kevin  
**Subject:** Comments FMC Hydro Study July 2013 Deliverable  
**Attachments:** Comments FMC Hydro Study July 2013 Deliverable.docx

See Attached.

Kevin Rochlin

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 10**

1200 Sixth Avenue, Suite 900  
Seattle, WA 98101-3140

OFFICE OF  
ENVIRONMENTAL CLEANUP

September 13, 2013

Reply to  
Attn. of ECL-111

Ms. Barbara Ritchie  
FMC Corporation  
1735 Market Street  
Philadelphia, Pennsylvania 19103

**RE: Unilateral Administrative Order for Remedial Design and Remedial Action  
EPA Docket No. CERCLA 10-2013-0116**

**Review comments, FMC OU Remedial Design, *Extraction Zone Hydrogeologic Study Work Plan*, MWH, July 2013**

Dear Ms. Ritchie:

EPA has reviewed the referenced document. Comments are enclosed. FMC should provide responses per the referenced order.

Sincerely,

A handwritten signature in black ink, which appears to read "Kevin Rochlin". The signature is written in a cursive, flowing style.

Kevin Rochlin,  
Project Manager

Enclosure

**Review comments, FMC OU Remedial Design, *Extraction Zone Hydrogeologic Study Work Plan*, MWH, July 2013**

**General Comments:**

1. The above mentioned document has been reviewed and the methods for aquifer testing are appropriate being step test, constant rate pump test and the combined 72-hour constant rate test of the initial three extraction wells. These test results will provide the necessary site specific hydraulic parameters with the water level drawdown to aid in the development of the design for the hydraulic containment system (HCS).
2. However, there must be continuous geologic logging and vertical water quality characterization profiling when installing the boreholes for the three extraction wells and piezometers from the water table down to the American Falls lake bed (AFLB) or aquitard. This information will be needed when selecting the location for the screen interval of the extraction wells and piezometers.
3. In order to improve the understanding of groundwater flow, a contour map of the top of the American Falls Lake Bed clay (AFLB) should be included in the work plan. In addition, the work plan should include a table that lists all monitoring and former production wells that have determined the depth of the top of the clay, the depth, and thickness of the AFLB clay if available. The contour map will enhance the conceptual site model for the site and the well information will be used during the selection of potential groundwater data for analysis and to select potential future monitoring well locations for sample collection and analysis.

**Specific Comments:**

**1.0 Introduction.**

1. page 1-1. The second paragraph describes the collection of groundwater samples from the extraction zones of wells EW-01-3 for laboratory analyses and a bulk water sample for a potential jar test for the evaluation of a water treatment system for the groundwater. No table could be found in this document which states the number of field samples, duplicates and QA samples. This table should be included in Section 4 or in the QAPP.
2. 1.3.2 Phase I HCS Pump Tests, page 1-4. The text states that the 24-hour constant rate pump test will only be performed on the western extraction well (EW-01). It is important to stress the aquifer at all three locations. Each of the wells (EW-02 and EW-03) must undergo the 24-hour constant rate pump test.

**2.0 FMC OU Hydrogeology and Groundwater Modeling Summary**

3. Section 2.1.1, second paragraph. The text refers to EMF RI Report Figure 3.3-2 as being located in Appendix B of the plan. The figure could not be located in Appendix B and should be included.
4. Section 2.1.2, third paragraph. The text refers twice to EMF RI Figure 3.3-6 as being located in Appendix B of the plan. The figure could not be located in Appendix B and should be included.
5. 2.1.3 Aquifer Test Results, page 2-3. Include Table 3.3-1 Hydraulic Conductivities and Transmissivities of EMF Aquifer from the EMF RI with this document.
6. Second paragraph, the conversion from 0.1 cm/s to ft/day must be corrected in the text.

### 3.0 Hydrogeologic Study Design

7. Section 3. Figure 1-3 presents the results of the flow path modeling which shows that the selected wells are likely to capture groundwater from the western plant area but would not capture groundwater from the eastern plant area. The two unnamed wells east of well EW-03 would apparently potentially capture groundwater from the eastern portion of the site, but are not included in this study. Groundwater monitoring results indicate that groundwater quality in wells 123, 145, and 136 is more contaminated than the average concentration of contaminants in wells 110, 146, and TW-9S presented in Table 3-2.

While it is acknowledged that the source of contamination in wells 123, 136, and 145 may not have originated within the FMC OU, the situation should be acknowledged and discussed in the work plan. This discussion should include an analysis of why EW-01, EW-02, and EW-03 were selected for the study rather than the two locations further east. In addition, the text should describe how the results of the pump test will be used to evaluate the placement of extraction wells that will contain water from the eastern portion of the site as part of the remedy.

8. 3.1.1 Extraction Wells, page 3-1. As mentioned in the general comments, it is important to have a good understanding of the site specific geology and the groundwater quality or the concentrations of the contaminants of concern (COCs). The Simplot OU of the EMF Superfund site used the roto-sonic drilling method and was able to get good recovery of the geology/lithology and was able to collect water quality samples using a field test kits for both phosphate and sulfate to make decisions on the placement of the screen interval and the length of the screen. This information would lead to a more effective extraction system by placing the screen interval through-out the known plume. Also, samples of the geological formation could be collected from the area selected as the screen interval to design a site specific filter pack around the screen. A roto-sonic drilling method is recommended by EPA based on the results from the Simplot design of their extraction system.
9. Figure 3-2. Make the following changes to this figure, after the total depth of 120 feet add (to AFLB). The text in section 3.1.1 must match what was placed on figure 3.2 the text states

a minimum of five-foot above the top of the screen for the filter pack and figure has 2-feet. I agree with the text (5-feet). As mentioned above, a field decision will be made on the length of the screen interval and this figure should state an approximate length, like 15 to 30 feet.

10. 3.1.2 Extraction Well Co-Installed Piezometers, page 3-2. The internal piezometers must have the same length of screen interval as the extraction well screen.
11. 3.2 Groundwater Piezometers, page 3-2. An additional piezometer is needed down gradient of EW-02 which should be located closer then MW-146.
12. 3.3 Aquifer Testing Network and Procedures, page 3-3. What was the rationale used for the selection of the locations for EW-01, 02 and 03? Why not place EW-01 or the extraction wells closer to the higher concentrations of the COCs, MW-122 or MW-145?

Again all three wells (EW-01, 02 & 03) need to undergo a 24-hour constant rate aquifer test.

The text in this section states that the extracted groundwater from phase I aquifer testing will be contained in storage tanks and characterized and cites SOP 4 (Investigation Derived Waste) as the SOP. Upon review of this SOP it looks as the purge water from the aquifer test may not be contained or tested but the rationale that may be used "*Over 20 years of analyses of groundwater from monitoring wells in the proximity of the planned wells /piezometers do not demonstrate any characteristics of a hazardous waste, and therefore would not be hazardous.*" The SOP continues to state that since it is not a hazardous waste it will be treated as a solid waste and can be disposed on site but it does not say where this water will be discharged. It is important not to discharge the purge water near the aquifer test site because it will comprise the results of this test. The location of the where the aquifer test purge water must be known. The approximate volume of water is + 1.2 million gallons. Also, the nearby monitoring wells, MW-123 and 145(based on second quarter 2009 data) shows concentration of arsenic at 205 µg/L and 483 µg/L. These concentrations are above the site standards of 10µg/L. It is not clear on how this purge water or IDW will be handled. More information is needed on how this IDW will be handled. I final determination of disposal will need to be made by EPA.

13. 3.4 Aquifer Testing Analysis and Model Update, page 3-3. The EPA does not see a need to make prediction of the long-term performance of the capture zone but must develop an evaluation method for determination of the capture zone for all of the extraction wells and to make sure that the contaminant plume is being captured. The EPA has a guidelines document, *A Systematic Approach for Evaluation of Capture Zones at Pump and Treat System*, (EPA 600/R-08/003, January 2008). This document uses a six step process for the evaluation of the extraction network for capture zones through a groundwater monitoring network. The EPA recommends a systematic approach for the evaluation of capture zones using multiple lines of evidence.
14. 3.5.1 Water Level Measurements, page 3-4. Table 3-1 must include another column next to the column location identification number, being the screen interval (MSL) for each well location. Also, the column 1-2 hour for the collection of water level data is not needed and

should be deleted. That information will be covered in the previous column and the column after.

15. 3.5.2 Groundwater Sample Collection, page 3-4. No information was provided on the number of water quality samples collected during these two aquifer test being the six hour step-test and the 72-hour pump test. Either table 3-2 or another table is needed that identifies the sample location, the parameters, number of samples, duplicates, MS/MSD, blanks etc. No such table could be found in section 4, QAPP. No mentioned is made on how this data will be validated for data use.

If a treatability study is going to be conducted was there a work plan for this treatability study?

16. Table 3-2. This table has a column of the average concentration of constituent in groundwater and list wells 110, 146 and TW-9S. Why were these locations selected? These wells are either down-gradient or cross-gradient of the three extraction wells that we undergo testing. If the objective is to show the potential water quality that will be collected from these three extraction wells then up-gradient monitoring wells must be selected and only average the concentration which is within the capture zone of those wells. As an example from figure 1-3, the particle tracking shows EW-01 using TW-5S & 122 the average total phosphorus concentration would be 10 mg/L and arsenic would be 60µg/L.

17. QAPP and FSP, page 4-1. A signature page is needed in the QAPP.

18. 4.3 Data Quality Objectives, page 4-3. The data quality objectives should be stated in the text of this section and from the Table 4-1 only one data quality objective was stated, "Verify Model Predictions and determine the alignment and layout for the final design of the full-scale HCS to capture contaminated groundwater before it migrates beyond the FMC Plant site". The EPA believes there are three data quality objectives:

- To installation five extraction wells and associated piezometers which will contain the groundwater that has impacted the shallow aquifer.
- To conduct aquifer testing to obtain site specific hydraulic parameters to design a full-scale HCS
- To collect groundwater samples from the new installed extraction wells to determine the direction of water treatment either option A (discharge and treatment at the City of Pocatello POTW) or option B (on-site treatment followed by infiltration/evaporation).

It is recommended that EPA and FMC discuss the data quality objectives for this hydrogeologic study work plan. Once the agreed upon DQOs have been set then table 4-1 could be finalized.

19. 4.3.1 Extraction Well and Piezometer Installation, page 4-2. Problem statements and decisions must be identified for each DQO for sections 4.3.1-4.3.3



20. 4.4 Sampling /Measurement Procedures. 4.4.1 Extraction Well and Piezometer Installation Procedures, page 4-3 and Appendix A, a.2.6

The development of the 2" diameter piezometer should meet the same criteria of the extraction wells.

21. Appendix A, a.5. X and Y coordinates must be reported out in the state of Idaho state plane coordinates northing and eastings.